

the reflector than they are on coincident areas on the camera photograph. The photo-discs of the stars on the camera photograph are largely out of proportion with the corresponding discs on the reflector photograph, and these large discs cover often several of the near stars which the larger instrument resolves into their separate components. There are vast areas on the camera photograph which to most of us would be accepted as evidence of nebulosity with dark tortuous rifts in it, but it is not nebulosity at all. It is in fact the effect of the diffused light of numerous and close stars being concentrated upon the photo-film by a small instrument, and the dark rifts are only areas with fewer stars on them; hence they aid in deceiving the eye, by causing the appearance that the crowded star areas are involved in true nebulosity. The lantern slide made from Professor Barnard's plate and now projected on the screen will serve as an illustration of these statements.

Photograph of the Crab Nebula M. 1 Tauri.

By Isaac Roberts, D.Sc., F.R.S.

The photograph of the nebula *M. 1 Tauri*, R.A. $5^{\text{h}} 28^{\text{m}}$, Decl. $21^{\circ} 57'$ north, was taken with the 20-inch reflector on 1895 January 25, with exposure of the plate during one hour, and the copy now presented is enlarged to the scale of 1 millimètre to 6 seconds of arc.

Two enlarged photographs of this nebula, with an exposure of three hours, were presented to the Society in 1892 May (*Monthly Notices*, vol. lii. p. 502), and this one, with an exposure of sixty minutes, shows less densely the extensions of the nebulosity which are shown on those of 1892; and the mottling, and star-like condensations within the denser parts of the nebula, are better seen on this photograph.

All the stars that are shown on the photograph of 1892 are also visible on this, and there is no obvious change in position angles or in brightness of the stars, or in the nebulosity, during the interval of three years between their respective dates.

Dark curved rifts are on the negative conspicuously visible in the dense parts of the nebula, and some of the nebulosity is visible in wispy curves and in condensations more or less star-like. The whole nebula is unsymmetrical in form, and when studied in connection with the descriptions herein given is suggestive of a state of great disturbances internally. One of the dark rifts referred to forms almost a straight line in *nf* and *sp* direction across the centre of the nebula, and has a star of about 15th magnitude at its centre; another rift forms a triple curve along the north margin of the nebula and extends nearly its whole length from the *south following* end to its *north preceding* end, where it stretches across the nebula to the *south* side.

Notwithstanding the evidence we have of great disturbances

affecting the substance of this nebula, the interval of three years since the first reliable records of its form and internal details were obtained is insufficient to enable me to say that any change has taken place in its structure; but this need cause no surprise, for I have compared a photograph of the great nebula in *Orion* which was taken in 1886 October with another taken in 1894 February, the interval between them being seven years and four months, and although that nebula appears also to be in a state of violent commotion, I have been unable to find that perceptible changes have taken place in the structure of the nebulosity.

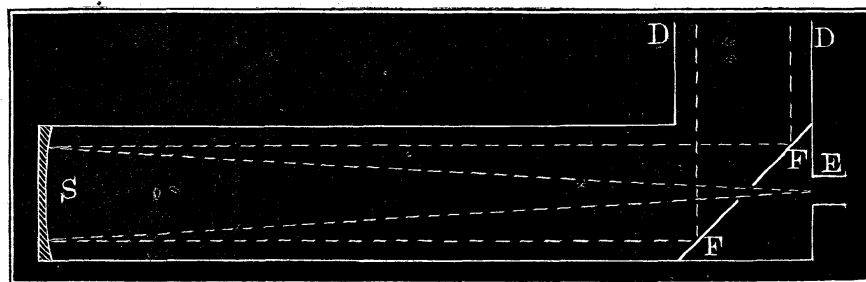
Our work, therefore, is to make, preserve, and publish accurate records of the present state of these celestial bodies on a scale sufficiently large to show their structure, and trust that our successors of twenty or thirty years hence will by repetition of our processes obtain data for largely increasing astronomical knowledge.

Note on a Suggested Form of Equatorial Mounting for a (modified) Newtonian Reflector. By Rev. Charles D. P. Davies, M.A.

Attention having been drawn by Dr. Common at the meeting in January to a modified form of Cassegrain reflector, and the general subject of reflectors having been thus brought into prominence, I beg to submit the following ideas, which I have long had in mind, on a modified form of Newtonian equatorial.

First as regards the telescope; second as regards its mounting.

For the form of the telescope I claim no novelty, as I remember seeing it suggested some years ago—I think by Mr. Brashear. It is essentially a modification of the Newtonian. The speculum, both in itself and in its position, is entirely Newtonian. But at the upper end of the tube is an elliptical flat, set at an angle of 45° , having its minor axis equal to the diameter of the speculum; that is to say, it fills up the tube. This flat is the first glass to receive the rays of light, which are admitted by a suitable opening in the side of the tube. The rays reflected at a right angle pass, still parallel to each other, down to the speculum, whence they are returned to a hole in the centre of figure of the flat. Through this hole they pass to the eyepiece.



S speculum, F flat, E eyepiece.

Fig. 1.